

Listing of Claims:

Claims 1-30 (Cancelled)

31. (Original) A sequential resonant tunneling device for back-side illumination, comprising an alternating semiconductor layer structure as follows:

Material		Thickness (nm)	Dopant	Doping level
c-plane (0001) sapphire substrate		Not limited	Not limited	Not limited
QW unit	AlN	10	un-doped	0
	Al _{0.2} Ga _{0.8} N	1000	silicon	1x10 ¹⁸ cm ⁻³
	Al _{0.27} Ga _{0.73} N	5	undoped	0
	GaN	4	undoped	0
	Al _{0.27} Ga _{0.73} N	7	undoped	0
	GaN	4	undoped	0
	⋮	⋮	⋮	⋮
	Al _{0.27} Ga _{0.73} N	7	undoped	0
	GaN	4	undoped	0
	Al _{0.27} Ga _{0.73} N	5	undoped	0
30 QW units	GaN	300	magnesium	1x10 ¹⁸ cm ⁻³

32. (Original) The sequential resonant tunneling device according to claim 31, further comprising metal contacts on surfaces of n and p type semiconductors.

33. (Original) A sequential resonant tunneling device for front-side illumination, comprising a multi-layered semiconductor structure, as follows:

	Material	Thickness (nm)	Dopant	Doping level
	c-plane (0001)	Not limited	Not limited	Not limited
	sapphire substrate			
	AlN	10	Undoped	0
	GaN	1000	Silicon	$1 \times 10^{18} \text{ cm}^{-3}$
	$\text{Al}_{0.25}\text{Ga}_{0.75}\text{N}$	5	Undoped	0
	GaN	4	Undoped	0
QW unit A	$\text{Al}_{0.25}\text{Ga}_{0.75}\text{N}$	7	Undoped	0
	GaN	4	Undoped	0
	\vdots	\vdots	\vdots	\vdots
30 periods	$\text{Al}_{0.27}\text{Ga}_{0.73}\text{N}$	7	Undoped	0
QW unit A	GaN	4	Undoped	0
	$\text{Al}_{0.25}\text{Ga}_{0.75}\text{N}$	4	magnesium	$1 \times 10^{18} \text{ cm}^{-3}$
QW unit B	$\text{Al}_{0.33}\text{Ga}_{0.67}\text{N}$	4	magnesium	$1 \times 10^{18} \text{ cm}^{-3}$
	\vdots	\vdots	\vdots	\vdots
25 periods	$\text{Al}_{0.25}\text{Ga}_{0.75}\text{N}$	4	magnesium	$1 \times 10^{18} \text{ cm}^{-3}$
QW unit B	$\text{Al}_{0.33}\text{Ga}_{0.67}\text{N}$	4	magnesium	$1 \times 10^{18} \text{ cm}^{-3}$
	GaN	10	magnesium	$1 \times 10^{18} \text{ cm}^{-3}$

34. (Original) The sequential resonant tunneling device according to claim 33, further comprising metal contacts on surfaces of n and p type semiconductors.

35. (Original) A sequential resonant tunneling device for front-side illumination comprising a multilayered semiconductor structure as follows:

		Material	Thickness (nm)	Dopant	Doping level
		6H-SiC substrate	Not limited	p-type	$1 \times 10^{18} \text{ cm}^{-3}$
		AlN	10	un-doped	0
		$\text{Al}_{0.27}\text{Ga}_{0.73}\text{N}$	5	Undoped	0
		GaN	4	Undoped	0
QW unit	{	$\text{Al}_{0.27}\text{Ga}_{0.73}\text{N}$	7	Undoped	0
		GaN	4	Undoped	0
30 periods QW units	{	⋮	⋮	⋮	⋮
		$\text{Al}_{0.27}\text{Ga}_{0.73}\text{N}$	7	Undoped	0
		GaN	4	Undoped	0
		$\text{Al}_{0.27}\text{Ga}_{0.73}\text{N}$	5	Undoped	0
		$\text{Al}_{0.2}\text{Ga}_{0.8}\text{N}$	1000	Silicon	$1 \times 10^{18} \text{ cm}^{-3}$
		GaN	10	Silicon	$1 \times 10^{18} \text{ cm}^{-3}$

36. (Original) The sequential resonant tunneling device according to claim 35, further comprising metal contacts on surfaces of n and p type semiconductors.

37. (Cancelled)